

BSc Biological Sciences

UCAS code: C100

Awarding Institution:	The University of Reading
Teaching Institution:	The University of Reading
Relevant QAA subject benchmarking group(s):	Biosciences
Faculty of Life Sciences	Programme length: 3 years
For students entering Part 1 in 2002	Date of specification: March 2004
Programme Director: Dr P.D. Darbre	
Programme Adviser: Dr S.M. Shimeld and Dr K Purdy	
Board of Studies: Biological Sciences	Accreditation: None

Summary of programme aims

The degree is concerned especially with the diversity of living organisms and includes studies of the biology of all types of organisms from viruses to flowering plants and mammals. The subject matter of Parts 1 and 2 is broadly based with specialisation in Part 3 to provide a coherent, in-depth area of study which the student will select. Students are expected to gain a broad understanding of the concepts underpinning biological sciences and to demonstrate the ability to complete a detailed study of at least one discipline during Part 3. They will receive training and be expected to demonstrate competence in laboratory techniques in biology, the use of computers to access information resources and the use of statistical programmes for data analyses. Students will be expected to acquire individual and group communication skills in written work and in oral and poster presentations. The development of critical reading skills will be strongly encouraged. (For a full statement of the programme aims and learning outcomes see below)

Transferable skills

The University's Strategy for Teaching and Learning has identified a number of generic transferable skills which all students are expected to have developed by the end of their degree programme. In following this programme, students will have had the opportunity to enhance their skills relating to career management, communication (both written and oral), information handling, numeracy, problem solving, team working and use of information technology.

As part of this programme all students are also expected to have gained experience and show competence in the following transferable skills:

1. The ability to assess, evaluate and present scientific data.
2. The ability to design and undertake a programme of scientific investigation and to effectively communicate the aims and results of this investigation.
3. A range of laboratory-based practical skills

Programme content

The profile that follows states which modules must be taken (the compulsory part), together with one or more lists of modules from which the student must make a selection (the 'selected' modules). Students must choose such additional modules as they wish, in consultation with their programme adviser, to make 120 credits in each Part. The number of module credits for each module is shown in brackets after its title.

Part 1 (three terms)

Compulsory modules

		<i>Credits</i>	<i>Level</i>
BI1S11	<i>Concepts and skills in biology 1</i>	10	C
BI1C10	<i>Cell Biology and biochemistry</i>	10	C
BI1C11	<i>Genetics and molecular biology</i>	10	C
BI1M10	<i>Biodiversity</i>	10	C

BI1S12	<i>Field Course</i>	10	C
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In addition, students must select one from

AM1M13	<i>Practical biochemistry</i>	10	C
BI1Z11	<i>Community ecology</i>	10	C

Also, students without AS or A2 level Chemistry or an equivalent qualification must take:

BI1S10	<i>Chemistry for biologists</i>	10	C
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Optional modules

Students will choose additional modules up to a total of 120 credits subject to the agreement of the Programme Adviser. This may include a range of Bioscience modules as listed below, plus modules from other areas of the University including languages from the Institution Wide Language Programme. Further details can be found in the Part 1 Biology Handbook.

AM1C12	<i>Animal physiology</i>	10	C
AM1M11	<i>Fundamental Microbiology</i>	10	C
AM1S10	<i>Introduction to biology</i>	10	C
AM1Z11	<i>Environmental biology</i>	10	C
AM1Z10	<i>The whole mammal</i>	10	C
AM1C13	<i>Digestion and nutrition</i>	10	C
AM1C14	<i>Biochemistry and metabolism</i>	10	C
AM1M12	<i>Important microbes</i>	10	C
AM1L10	<i>Animal biology</i>	20	C
PS1HQ2	<i>Applied Plant Physiology</i>	10	C
PS1BB2	<i>Morphology of land plants</i>	10	C
PS1BB1	<i>Current topics in plant</i>	10	C
PS1BA2	<i>Plant development</i>	10	C
PS1BA1	<i>How plants work</i>	10	C
PS1AB2	<i>Physical ecology</i>	10	C
PS1AA1	<i>Plants in agriculture</i>	10	C

Part 2 (three terms)

Compulsory modules

A compulsory concepts and skills module, worth 10 credits in total, will further develop the transferable skills students have acquired at Part 1.

AM2S31	<i>Concepts and skills 2</i>	10	I
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Optional modules

Students will choose additional modules up to a total of 120 credits subject to the agreement of the Programme Adviser. This may include a range of Bioscience modules, plus modules from other areas of the University including languages from the Institution Wide Language Programme. Details can be found in the Part 2 Biology Handbook. No more than 60 credits may be taken in any one term.

Term 4

AM2C31	<i>Molecular biology and bioinformatics</i>	10	I
AM2C32	<i>Endocrinology</i>	10	I
AM2C33	<i>Pharmacology and toxicology</i>	10	I
AM2C34	<i>Introduction to human disease</i>	10	I
AM2C35	<i>Cellular biology</i>	10	I
AM2M33	<i>Practical virology</i>	10	I
AM2M32	<i>Physiology of the bacterial cell</i>	10	I
AM2Z32	<i>Vertebrate zoology</i>	10	I
AM2Z33	<i>Animal behaviour</i>	10	I
BI2B31	<i>Macro-evolution</i>	10	I
PS2AA2	<i>Crop Physiology & Breeding</i>	10	I
PS2AB4	<i>Weed Biology and Control</i>	10	I
PS2BB4	<i>Evolution of Plant Biodiversity</i>	10	I
PS2BC4	<i>Plants and the Environment</i>	10	I
PS2BE4	<i>Plant Anatomy</i>	10	I
PS2BG4	<i>British Flora and Vegetation (Field Course)</i>	10	I

Term 5

AM2C36	<i>Protein structure and function</i>	10	I
AM2C37	<i>Cardiovascular and respiratory systems physiology</i>	10	I
AM2C38	<i>Receptors and signal transduction</i>	10	I
AM2C39	<i>Regulation of gene expression</i>	10	I
AM2M31	<i>Viruses and their hosts</i>	10	I
AM2M34	<i>Molecular genetics of bacteria</i>	10	I
AM2M35	<i>Medical Microbiology</i>	10	I
AM2Z34	<i>Invertebrate zoology</i>	10	I
AM2Z35	<i>Immunology</i>	10	I
AM2Z36	<i>Development</i>	10	I
AM2Z37	<i>Aquatic biology</i>	10	I
BI2Z31	<i>Micro-evolution</i>	10	I
CH2O2	<i>Organic Chemistry for Biochemists</i>	10	I
PS2AA5	<i>Plant Genetics</i>	10	I
PS2AB5	<i>Crop Pests & Integrated Crop Protection</i>	10	I
PS2BA5	<i>Plants and Man</i>	10	I
PS2BC5	<i>Ecological aspects of environmental assessment</i>	10	I
PS2BE5	<i>Plant Biochemistry</i>	10	I
PS2HS5	<i>Introduction to Fungi</i>	10	I

Term 6

AM2C40	<i>Recombinant DNA exercise</i>	10	I
AM2Z39	<i>Practical Molecular Zoology</i>	10	I

These modules run in weeks one and two of term 6. They are mutually exclusive.

Part 3

Compulsory modules

Two compulsory modules, worth 60 credits in total, occupy 30 credits in Term 7 and 30 credits in Term 8. The Project is designed to take students to the cutting edge of Biological research, while the Essays and Seminars Module will hone students analytical, information handling and presentational skills.

		<i>Credits</i>	<i>Level</i>
AM3S75	<i>Biology Project</i>	40	H
AM3S76	<i>Essays and Seminars</i>	20	H

Optional modules

Students will choose additional modules up to a total of 120 credits subject to the agreement of the Programme Adviser. Details of the wide range of available modules can be found in the Part 3 Biology Handbook, and relevant modules are listed below. In this final year students will be expected to focus their studies in one of several possible specialisations, including Zoology, Microbiology, Biochemistry and Botany. No more than 60 credits may be taken in any one term.

Term 6 (following the Part 2 exams or in the Summer Vacation)

AM3Z80	<i>Marine Biology Field Course</i>	10	H
AM3Z81	<i>Equine Management*</i>	10	H
AM3Z78	<i>Biology of Spiders</i>	10	H

* This module is based at Sparsholt College. Availability to be confirmed. Biology of Spiders will run in weeks 8, 9 and 10.

Term 7

AM3C71	<i>Biochemistry & Physiology of Cardiovascular Disease</i>	10	H
AM3C72	<i>Life and Death of the Cell</i>	10	H
AM3C73	<i>Chromosome Mapping and Genetic Disease</i>	10	H
AM3M71	<i>Specialised Groups of Bacteria</i>	10	H
AM3M72	<i>Bacterial Pathogenicity</i>	10	H
AM3Z71	<i>Developmental Biology</i>	10	H
AM3Z72	<i>Insects and Society</i>	10	H
AM3Z74	<i>Conservation Biology</i>	10	H
AM3Z75	<i>Evolutionary Genetics and Phylogeny</i>	10	H
AP3A76	<i>Principles and Practice in Biological Control</i>	10	H
AP3A67	<i>Animal Welfare</i>	10	H

Term 8

AM3C76	<i>Neurobiology</i>	10	H
AM3C77	<i>Structural Biology</i>	10	H
AM3C78	<i>Mammalian Reproduction</i>	10	H
AM3C79	<i>Pathology and Clinical Biochemistry</i>	10	H
AM3C80	<i>Cancer</i>	10	H
AM3M73	<i>Viruses as Pathogens</i>	10	H
AM3M74	<i>Molecular Microbiology</i>	10	H
AM3Z76	<i>Behavioural Ecology and Life History Theory</i>	10	H
AM3Z77	<i>Research Topics in Aquatic Ecology</i>	10	H
AP3A68	<i>Wildlife in the Farming Environment</i>	10	H

Progression requirements

To proceed to Part 2 it is sufficient to have obtained at least 40% in all modules averaged together and have no module mark below 30%. An exception may be made for up to two units scoring below 30%, provided due diligence has been shown by the student during the relevant units and examinations.

To proceed from Part 2 to Part 3 it is sufficient to obtain an overall average of at least 40% and have no module mark below 30%. An exception may be made for up to two units scoring below 30%, provided due diligence has been shown by the student during the relevant units and examinations.

Summary of teaching and assessment

Teaching is organised in modules. Teaching in Part 1 consists of lectures and practical classes with small group work being largely restricted to the Concepts and Skills module. Modules can be assessed by 100% coursework but more usually are assessed by a combination of coursework (30%) and formal examination (70%).

In Parts 2 and 3, lectures and practical classes continue to be major modes of teaching but they are increasingly supplemented by seminars and other group work. Modules can be 100% in-course assessed but are more usually assessed by a combination of coursework (30%) and formal examination (70%).

Part 2 contributes one third of the overall assessment and Part 3 the remaining two thirds. In order to be eligible for Honours, students must gain at least 40% in all Part 3 examinations averaged together and must gain at least 40% in the Biology Project module.

The assessment is carried out within the University's degree classification scheme, details of which are in the programme handbooks.

Admission requirements

Entrants to this programme are normally required to have obtained:

UCAS Tariff: 260 points from no more than 4 AL or AS subjects including C in at least two AL science subjects, plus Mathematics, Double Science and English at Grade B at GCSE level.

International Baccalaureat: 30 points

Scottish Highers BBBB (Biology B)

Irish Leaving Certificate: BBBBC (Biology B)

GNVQ is accepted and mature students are also encouraged to apply

Admissions Tutor: Dr P.D.Darbre

Support for students and their learning

University support for students and their learning falls into two categories. Learning support includes IT Services, which has several hundred computers and the University Library, which across its three sites holds over a million volumes, subscribes to around 4,000 current periodicals, has a range of electronic sources of information and houses the Student Access to Independent Learning (S@IL) computer-based teaching and learning facilities. There are language laboratory facilities both for those students studying on a language degree and for those taking modules offered by the Institution-wide Language Programme. Student guidance and welfare support is provided by Personal Tutors, the Careers Advisory Service, the University's Special Needs Advisor, Study Advisors, Hall Wardens and the Students' Union.

In addition to the above, the School of Animal and Microbial Sciences has several well-equipped teaching laboratories and a dedicated computer laboratory providing students with in-house access to on-line educational material. The School of Animal and Microbial Sciences also houses an extensive Zoological museum and collection and the School of Plant Sciences a herbarium and botanic garden. These provide a rich source of material and specimens that are incorporated into several modules.

Career prospects

Reading Biological Science graduates are eligible for membership of the Institute of Biology and can achieve Chartered Biologist status. They are qualified to enter a variety of careers in the biological sciences, including work in industry (pharmaceuticals, biomedical, agrochemicals), government service (research institutes and bodies such as the Environment Agency) and other public bodies (local conservation units, animal charities). As numerate scientists they also enter a wide variety of commercial and business occupations.

Opportunities for study abroad

Students of Biological Sciences can take part in the Erasmus exchange programme in which they can spend the first term of Part 3 studying in a variety of other European Universities. Recent exchanges involving AMS students have taken place with the following: University of Tours, France; Odense University, Denmark; Uppsala University, Sweden; University College Cork, Ireland; University of Zaragoza, Spain; ENSA, Montpellier, France; University of Cagliari, Sardinia. Students also have the opportunity to go to Rostock University, Germany and Siena University, Italy.

Educational aims of the programme

The BSc in Biological Sciences is concerned especially with the diversity of living organisms. It includes study of the biology of all types of organisms, from microorganisms to flowering plants and mammals, at a level ranging from the molecular, biochemical and cellular to the physiological, environmental and ecological. The subject matter of Parts 1 and 2 is broadly based with specialisation in Part 3 to provide a coherent, in-depth area of study which the student will select. Students are expected to gain a broad understanding of the concepts underpinning biological sciences and to demonstrate the ability to complete a detailed study of at least one discipline during Part 3.

Programme Outcomes

The programme provides opportunities for students to develop and demonstrate knowledge and understanding, skills, qualities and other attributes in the following areas:

Knowledge and Understanding

<p>A. Knowledge and understanding of:</p> <ol style="list-style-type: none">1. The basic principles underlying the biological sciences2. The variety of groups of living organisms, from viruses and bacteria to complex multicellular organisms such as mammals and flowering plants3. Different levels of biological organisation of living organisms, from the molecular, biochemical and cellular to the physiological, environmental and ecological4. In depth understanding of least one specialist field of biology, the precise area to be selected by the student.	<p>Teaching/learning methods and strategies Compulsory and optional modules in Parts 1 and 2 introduce students to the diversity of living organisms at a variety of levels. A wide range of teaching strategies is employed in these modules, initially in relatively large-group lecture and practical sessions in Part 1. Smaller group teaching comes to dominate in Parts 2 and 3 and includes, depending on the modules chosen, additional teaching methods such as seminars, fieldwork and discussion sessions. Students will also have the option of attending full-time field courses during vacations. In Part 3 students will be able to select a specific area of biology for in-depth study and will undertake a research project with one-to-one supervision by a member of academic staff or equivalent.</p> <p><i>Assessment</i> Knowledge and understanding gained in the majority of modules will be assessed by a combination of coursework and formal examination. Some modules, for example field courses, will be assessed by 100% coursework. The project undertaken in Part 3 will be assessed primarily by written report.</p>
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Skills and other attributes

<p>B. Intellectual skills – able to:</p> <ol style="list-style-type: none">1. Address problems in a logical and structured manner2. Manipulate and analyse numerical data3. Construct and test hypotheses4. Critically evaluate scientific literature and data	<p>Teaching/learning methods and strategies Basic skills associated with problem solving and data analysis are taught in a specific module using a variety of teaching methods. These skills are further developed in individual modules, for example on Field Courses students in small groups will be taught how to construct and logically investigate a hypothesis and to analyse the data produced. In Part 3 students are able to enhance their critical and analytical skills by undertaking a project and to demonstrate this by presenting the results in an accompanying dissertation.</p> <p><i>Assessment</i> Assessment of 1 and 2 is by examination. Critical evaluation of scientific data and literature is assessed in essay and dissertation form.</p>
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C. Practical skills – able to:

1. Conduct practical laboratory and/or fieldwork safely and successfully.
2. Design and undertake a programme of scientific investigation

Teaching/learning methods and strategies

Practical laboratory skills will be taught in Departmental teaching laboratories while fieldwork forms an integral part of several modules and is specifically taught on optional Field Courses. Further practical and field skills may also form part of the Part 3 project, where students will be taught on a one-to-one basis how to design and implement a programme of scientific investigation.

Assessment

Skill 1 is typically assessed by course work, while skill 2 is assessed by written report.

D. Transferable skills:

1. To be able to communicate effectively in both written and oral form
2. To be numerate and capable of approaching problems in a logical and structured manner
3. To be able to operate effectively as part of a team
4. To be familiar with IT operation and resources
5. To be able to work independently
6. To be able to effectively plan and time manage projects

Teaching/learning methods and strategies

Specific Concepts and Skills modules in Parts 1 and 2 teach skills 1 to 4 using a combination of seminars, demonstrations and practical approaches. In addition, other modules include aspects of different skills, for example Field Courses include teamworking as part of structured group work and many modules include an integral component of written and oral communication as coursework. In Part 3 students undertake a detailed solo project during which their individual planning and time management skills are developed through contact with their academic supervisor.

Assessment

Numeracy and Problem Solving are assessed by specific exam. Other skills are assessed by coursework as part of the Concepts and Skills modules. In addition, most individual modules include written and oral coursework as 30% of the total module assessment.

Please note: This specification provides a concise summary of the main features of the programme and the learning outcomes that a typical student might reasonably expect to achieve and demonstrate if he/she takes full advantage of the learning opportunities that are provided. More detailed information on the learning outcomes, content and teaching, learning and assessment methods of each module can be found in module and programme handbooks.